

# Radiology Case Reports

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## Epidermoid cyst of the breast: Mammography, ultrasound, MRI

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Epidermal cysts are common cysts located cutaneously or subcutaneously in the head, neck, and trunk. However, deep epidermal cysts of the breast are very rare, and are frequently associated with traumatic implantation. We present the case of a 62-year-old woman with a palpable mass in the right breast. The patient was evaluated using mammography, ultrasound, and MRI, which uniquely characterized the mass and revealed a second mass. Histological analysis revealed fragments of an epidermoid cyst. The origin of the cysts and location deep within the breast tissue likely were due to a previous bilateral-reduction mammoplasty.

### Case report

A 62-year-old black female presented with the complaint of a nonpainful palpable abnormality in her right breast. The patient's history was significant for a bilateral reduction mammoplasty two years prior and a hysterectomy 18 years prior. She also had a history of Cushing's syndrome, metabolic syndrome, and smoking. She was currently on hormone-replacement therapy. A mammogram and right breast ultrasound were ordered in order to evaluate the abnormality.

The mammogram confirmed the presence of a 1.5-x-1.7-cm, well-circumscribed lesion of homogeneous density in the lower outer quadrant of the right breast (Fig. 1). Additionally, there was architectural distortion, possibly due to the reduction mammoplasty inferior to the mass.

Next, a targeted ultrasound of the right breast showed the mass to be 1.5 cm, heterogeneously echoic, and well-defined in the 7:00 location (Fig. 2). In addition, at the 6:00 region, a smaller anechoic nodule was found abutting the

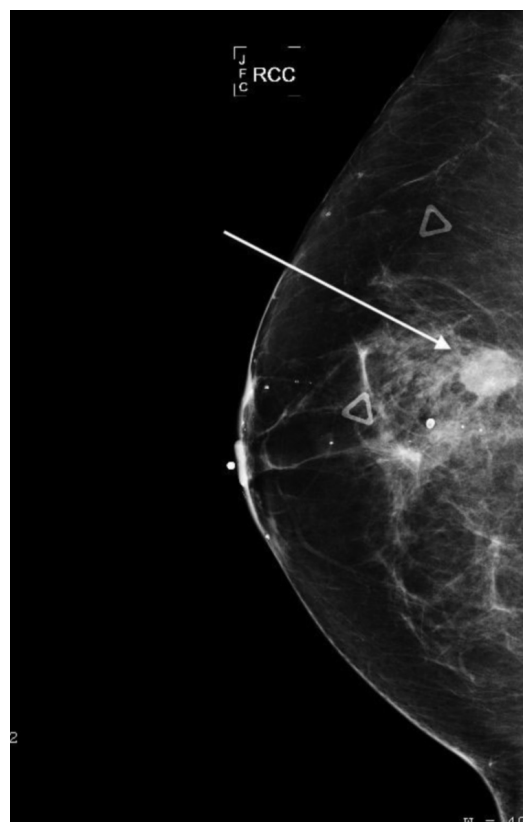


Figure 1. 62-year-old female with epidermoid cyst of the breast. Mammogram shows a well-circumscribed mass (arrow).

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Figure 2. 62-year-old female with epidermoid cyst of the breast. Ultrasound shows a well-circumscribed, heterogeneously echogenic, lamellated nodule with increased through transmission.

chest wall (Fig. 3). This second mass measured 1.1 x 0.5 cm. Within the 7:00 mass, there were concentric hypoechoic and hyperechoic rings (Fig. 2). Neither lesion demonstrated hypervascularity on Doppler ultrasound. The lesions were considered suggestive of malignancy. Biopsy and a breast MRI were recommended for further evaluation.

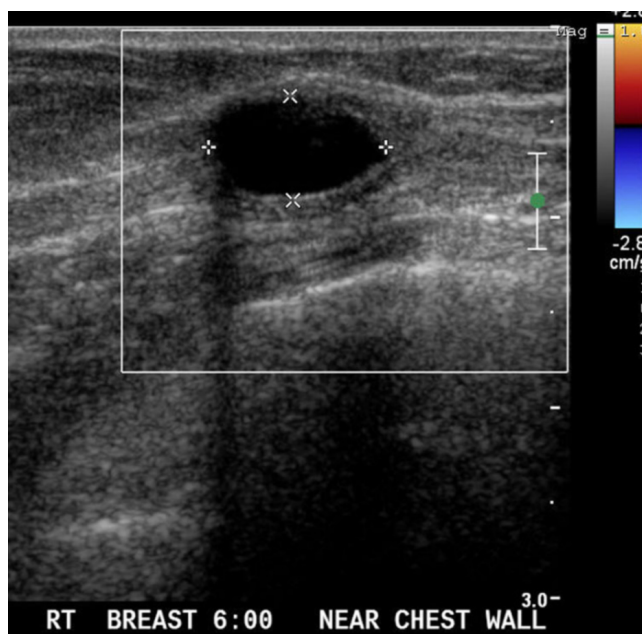


Figure 3. 62-year-old female with epidermoid cyst of the breast. Ultrasound shows a second well-circumscribed anechoic cyst with a thick wall.

Breast MRI included gadolinium-enhanced T1 axial images and T2 fat-suppressed images. In the lower outer quadrant of the right breast, there was a thick-walled hypoenhancing nodule that corresponded to the palpable mass (Figs. 4, 5). As seen in Fig. 3, the mass had a hypoenhancing rim and an inner, thick, higher-signal ring, followed by another inner low-signal ring surrounding a central area of higher signal. The mass was located deep within the breast parenchyma, without obvious attachment to the dermis. The mass was rated BI-RADS IV, and a biopsy was recommended.

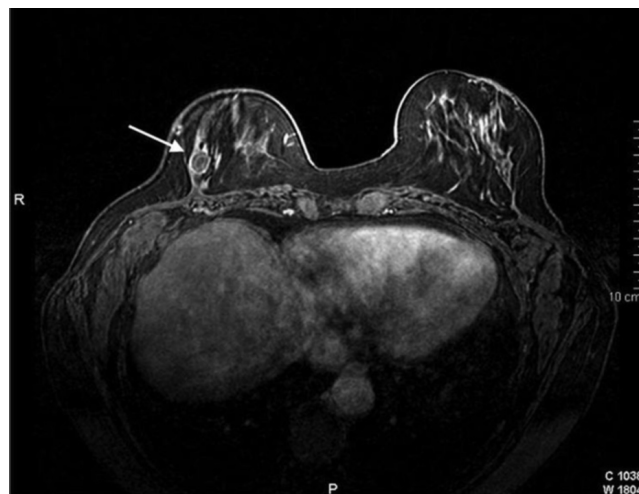


Figure 4. 62-year-old female with epidermoid cyst of the breast. Gadolinium-enhanced, fat-suppressed, axial, T1-weighted MRI shows a well-circumscribed, thick-walled, lamellated nodule (arrow).

Ultrasound-guided biopsy was performed on the lower outer quadrant mass, and five core samples were obtained using a 14-gauge Viacore core-biopsy needle. The biopsy samples consisted of yellow-tan fragments of tissue and were determined to be fragments of an epidermoid cyst. Histopathologic analysis revealed fragments of epidermoid cyst.

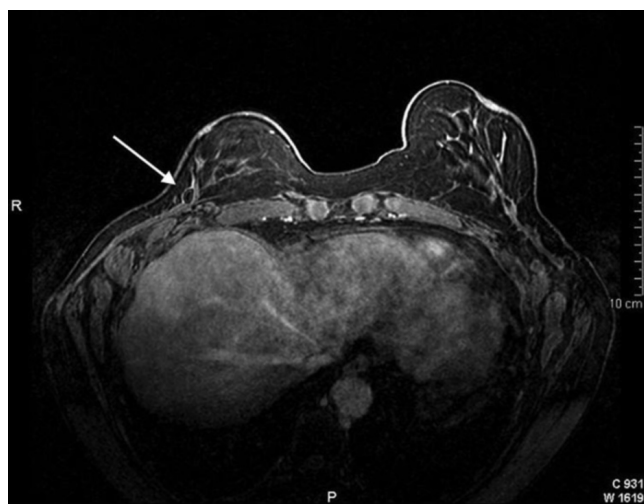
### Discussion

This case is unique in that we identified a deep intramammary epidermoid cyst visualized via three radiographic modalities: mammography, MRI, and ultrasound. The mammogram showed the presence of a lower outer quadrant mass that was palpable. Ultrasound showed the masses to be well-circumscribed, and at least one was cystic. The masses were not vascular. The MR images demonstrated the lamellated nature of the lesions. In both MR images, the cyst was imbedded in high-signal linear tissue which, when followed, proved to be the surgical scar. The diagnosis of ruptured epidermoid cyst was confirmed by histopathologic evaluation.

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The differential diagnosis included benign lesions such as fibroadenoma, dermoid, lipoma, and complex or hemorrhagic cysts.

Epidermoid cysts are benign epithelial cysts that usually arise in the face, neck, or trunk region (1). Grossly, they often present as outward protrusions of the skin. However, in the breast they frequently are inclusion cysts expanding



**Figure 5.** 62-year-old female with epidermoid cyst of the breast. Gadolinium-enhanced, fat-suppressed, axial, T1-weighted MRI shows a second nodule (arrow) to be cystic.

in toward the flexible subcutaneous tissue (2, 3). The cysts are filled with lamellated keratin. This lamellated appearance was seen on both MRI and ultrasound (Fig. 4), and the brown appearance of the keratin was seen in the biopsy samples (3).

Breast epidermoid cysts are rare, but they are thought to arise via one of three mechanisms. One mechanism is an obstructed hair follicle. A second mechanism is the squamous metaplastic transformation of the columnar cells. This metaplasia usually is associated with a fibroadenoma or area of fibrocystic transformation, which was not seen in this patient. The third mechanism is trauma—for example, from needle biopsy or reduction mammoplasty (2, 4). For this patient, the last mechanism is most likely, considering her reduction mammoplasty surgery two years ago and the depth of both masses within the breast.

Epidermoid cysts result from reduction mammoplasties if a fragment of the epidermis becomes implanted within the breast tissue. During the mammoplasty, the nipple/areola is repositioned along with a vascularized tissue pedicle, often requiring infolding of the tissue. Although the pedicle is de-epithelialized, small fragments may remain and later result in the development of epidermoid cysts. These cysts can also develop on the medial or lateral skin flaps along the inframammary incision line (5). This patient's images demonstrated the presence of two similar lesions: one located in the lower outer quadrant, and the second located just infe-

rior to the breast adjacent to the chest wall. These cysts developed deep to the dermis but along the incision lines, suggesting that they are a result of her prior surgery.

Potential complications of epidermoid cysts include spontaneous rupture (as in this case), malignancy, and Paget's disease. Rupture leads to inflammation due to the release of keratin, as well as possible infection or abscess formation (4, 6). There is limited literature regarding the malignancy potential of epidermoid cyst, but it is estimated to be between 0.5% and 19% (7). Current recommendations regarding treatment are to excise the cyst and thereby eliminate the risk of complications (8).

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